QUARTERLY PROGRESS REPORT

Project Title:	Project 2001-15, Technical Solutions to Overcrowded Park & Ride Facilities

RFP NUMBER: NJDOT #2001-15	NJDOT RESEARCH PROJECT MANAGER: Edward Kondrath
TASK ORDER NUMBER/Study Number: RFCUNY 17 / 49777-16-03	PRINCIPAL INVESTIGATOR: Dr. Kyriacos C. Mouskos
Starting Date: January 1, 2002	Period Ending: March 31, 2003
Ending Date: June 30, 2003 - extended	

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	10	10	95	9.5
1.	20	30	70	14.0
2.	15	25	50	7.5
3.	15	5	95	14.25
4.	20	45	55	11.0
5	10	25	35	3.5
Final Report	10	0	0	0
TOTAL	100%			59.75%

1. Progress this quarter by task:

Literature Search	*Presentation of Summary Search Results. Discussion to Support and Refine the Project Tasks* Technologies for ingress and egress to/from parking facilities surveyed: Inductive Loop detectors, Video Image Processing, Acoustic Detector. A review of Park and Ride Facilities in the US and Canada is nearing completion. A review of parking reservation systems is nearing completion. A review of parking payment systems is nearing completion. A review of parking guidance systems is nearing completion. **A draft report on the literature review will be submitted at the end of April, 2003.**
Task 1	Report on Needs Assessment Analysis for NJDOT's Park & Rides Program **The Clinton Point park and Ride Facility will be the first site that will be surveyed by the end of the fifth quarter as well as 2-3 other facilities as designated by the NJDOT .** **The first version of the NJDOT Park & Ride Facilities expanded database model will be ready at the end of March 2003. This database will incorporate the one developed by the NJDOT.**
Task 2	*Data collection for NJDOT Park & Ride locations.* Memorandum of Park and Ride Database, and Analytical Findings Infrastructure, traffic control and traffic flow data per park and ride facility will be recorded into an Access database. **An additional questionnaire for users of park and ride facilities will be completed and will be distributed at some facilities. The data collection on selected park and ride facilities will be undertaken during the 5th and 6th quarters.**
Task 3	Report on Park & Ride monitoring systems

	• A review of the technologies under development or reviewed by the researchers at the TIDE center will also be documented under this task (Dr. Niver, Dr. Mouskos and one research assistant). **Literature review is nearing completion** • The literature review on planning/management/demand modeling will be undertaken by Dr. Boile and Dr. Mouskos and two research assistants. **Literature review is nearing completion** • Literature review on parking payment systems, monitoring systems and parking information and reservation systems will be undertaken by Dr. Mouskos, Dr. Holguin-Veras, Dr. Tavantzis (NJIT-TIDE) and one research assistant. **Literature review is nearing completion** • A cost analysis of traffic monitoring systems will be undertaken by Dr. Mouskos. **Literature review on Cost data on traffic monitoring systems is continuing**
Task 4	*A Park & Rides Planning/Management/Approach for NJDOT* • Report on an arrival/departure forecasting system per park and ride existing location, • Report on a real-time parking space availability and parking cost information system • Report on parking payment systems • Report on parking reservation systems • Report on maintenance and operations • A planning model for the identification of future park and ride facility needs. A report outlining a comprehensive planning model that will capture the intermodal and dynamic characteristics of park and ride facilities subject to parking space availability in real time and travelers's choices (automobile only, transit only and intermodal (park & ride). • The product of this proposed task will be a prototype software, which will analyze traffic on intermodal corridors and will determine the effects of parking, transit and congestion information provided to drivers, on corridor performance. **A first intermodal planning model for the I-80 corridor using the TRANSCAD software has been developed**
Task 5	*Integration of the Park and Ride planning/information model with VISTA (Dr. Ziliaskopoulos, Dr. Boile, Dr. Mouskos, Dr. Holguin-Veras)* A prototype integration of the NJDOT Park and Ride facilities databases into VISTA A prototype implementation of the intermodal planning model (Task 4) within VISTA **A set of park and ride facilities that are in the vicinity of the I-80 corridor have been integrated within the VISTA system.**
Task 6	Quarterly progress reports, and final report with appropriate tables, graphs and chart in hard copy version, pdf file format, Word 97 and CD ROM. **Fifth quarterly report is due on March 31, 2003.**

2. Proposed activities for next quarter by task

Literature Search	*Presentation of Summary Search Results. Discussion to Support and Refine the Project Tasks* **Technologies for ingress and egress to/from parking facilities surveyed: Inductive Loop detectors, Video Image Processing, Acoustic Detector – First draft completed.** **A review of Park and Ride Facilities in the US and Canada will continue – First draft completed** **A review of parking reservation systems will continue – First draft completed**

	A review of parking payment systems will continue – First draft completed **A review of parking guidance systems will continue – First draft completed** **Final draft will be submitted to NJDOT at the end of April, 2003**
Task 1	Report on Needs Assessment Analysis for NJDOT's Park & Rides Program This task was delayed and will be completed during the 5th and 6th quarters. **Interviews with New Jersey Transit managers responsible for their corresponding Park and Ride program will be completed and documented.** **A list of potential needs for NJDOT park and ride facilities will be prepared.** **Additional elements to be included in the expanded NJDOT Access database for Park and Ride facilities will be identified and incorporated.**
Task 2	*Data collection for NJDOT Park & Ride locations.* Memorandum of Park and Ride Database, and Analytical Findings Infrastructure, traffic control and traffic flow data per park and ride facility will be recorded into an Access database. **Data collection for NJDOT Park and Ride Locations will be completed based on the list provided by NJDOT for the I-80 corridor as well as additional facilities.**
Task 3	Report on Park & Ride monitoring systems • A review of the technologies under development or reviewed by the researchers at the TIDE center will also be documented under this task (Dr. Niver, Dr. Mouskos and one research assistant). **First Draft completed, work will continue until the end of the project.** • The literature review on planning/management/demand modeling will be undertaken by Dr. Boile and Dr. Mouskos and two research assistants. **First Draft completed, work will continue until the end of the project** • Literature review on parking payment systems, monitoring systems and parking information and reservation systems will be undertaken by Dr. Mouskos, Dr. Holguin-Veras, Dr. Tavantzis (NJIT-TIDE) and one research assistant. **First Draft completed, work will continue until the end of the project** • A cost analysis of traffic monitoring systems will be undertaken by Dr. Holguin-Veras with the assistance of Dr. Mouskos. **First draft will be submitted at the end of the 5th quarter**
Task 4	*A Park & Rides Planning/Management/Approach for NJDOT* • Report on an arrival/departure forecasting system per park and ride existing location, **An arrival/departure forecasting system for NJIT's parking deck will be presented that will provide daily ingress/egress traffic flow profiles. A report on the arrival/departure forecasting system will be submitted.** • Report on a real-time parking space availability and parking cost information system. **A web-based system on parking information will be presented.** • Report on parking payment systems **A report on parking payment systems will be completed.** • Report on parking reservation systems **The algorithm developed in the previous quarters will be further enhanced to handle large-scale systems.** **A web-based parking information and reservation system will be presented.** • Report on maintenance and operations **Data will be reported on maintenance and operations of NJDOT park and ride facilities.** • A planning model for the identification of future park and ride facility needs. A

	report outlining a comprehensive planning model that will capture the intermodal and dynamic characteristics of park and ride facilities subject to parking space availability in real time and travelers's choices (automobile only, transit only and intermodal (park & ride). **The prototype intermodal planning model will be presented to NJDOT.** **A report on the intermodal planning model developed will be completed.** **Final Product:** *The product of this proposed task will be a prototype intermodal planning model, implemented on the I-80 corridor, which will be able to analyze traffic on intermodal corridors and will determine the effects of parking, transit and congestion information provided to drivers, on corridor performance*.
Task 5	*Integration of the Park and Ride planning/information model with VISTA (Dr. Ziliaskopoulos, Dr. Boile, Dr. Mouskos, Dr. Holguin-Veras)* **A prototype integration of the NJDOT Park and Ride facilities databases into VISTA will be completed.** A prototype implementation of the intermodal planning model (Task 4) within VISTA **The integration will be completed.**
Task 6	Quarterly progress reports, and final report with appropriate tables, graphs and chart in hard copy version, pdf file format, Word 97 and CD ROM. **Sixth quarterly report is due on June 30, 2003.**

3. List of deliverables provided by this quarter by task (product date)

Publications:

- Bernstein, D., Mouskos, K.C., and J. Tavantzis, "Implementation of the Barrier Method to Solve the Parking Spatial Price Equilibrium Problem," submitted for consideration to the Transportation Research Part C transportation journal.
- Sun Wu, K.C. Mouskos and D. Bernstein "A Web-Based Parking Information and Reservation System," Presented at the 2003 Annual Transportation Research Board Meeting, Washington, DC.
- Mouskos, K.C., D. Bernstein, and J. Tavantzis, "An Integer Linear Programming Formulation of Deterministic and Stochastic parking Reservation Systems (PRS) with Fixed Costs," submitted to the Transportation Research Part C Journal, March, 2002.
- Mouskos, K.C., D. Bernstein, and J. Tavantzis, "An Integer Linear Programming Formulation of Deterministic and Stochastic Parking Reservation Systems (PRS) with Fixed Costs," presented at the annual Transportation Research Board meeting, January, 2002; published at the TRB CD-ROM.

Working Papers:

Bernstein, D., Mouskos, K.C., and J. Tavantzis, "Solution Algorithms to Solve the Spatial Price Equilibrium Problem," expected to be completed by June, 2003 and submitted for publication at a transportation journal.

Development of a web-based parking information and reservation system. The first version of the web-based system has been completed and will be further improved by the end of the 6th quarter.

Pilot Test of a parking payment system

The pilot test has been postponed until a final agreement is reached by the City of Newark and Mobipower Ltd. (formerly Teleparking Systems). Meetings will continue between the TIDE center, Mobipower and the City of Newark.

4. Progress on Implementation and Training Activities

A training on the VISTA system which will be used to implement the intermodal planning model will take place on the 12th and 13th of December at NJIT as part of the NJDOT project "Development of a DTA/simulation planning model for the NJDOT I-80 ITS Priority Corridor"

5. Problems/Proposed Solutions

A no-cost extension was requested until June 30, 2003.

6. Budget Summary

N/A

Total Project Budget(# of years)	$76,414
Total Project Expenditure to date	$56,000
% of Total Project Budget Expended	73%
Task Order Number/Study Number:	RFCUNY 17
Current Task Order Budget (# of years)	
Actual Expenditure to date against current task order	
% of current task order budget expended	%